

CLAIMS

1. A method for manufacturing a thin-film semiconductor, comprising the step of polycrystallization to focus visible light pulse laser (22) into a line shape on a surface of an object to be irradiated, and repeat irradiation with displacing said visible light pulse laser (22) such that a line-shaped irradiated region (35) is overlapped with a region (35) irradiated at a next timing in a width direction of the line-shaped irradiated region, to form a polycrystalline silicon film on the surface of said object,

wherein said step of polycrystallization applies ultraviolet light pulse laser (23) onto a second irradiated region (36) partially overlapping said first irradiated region (35) while or before said visible light pulse laser (22) is applied to said first irradiated region (35).

2. The method according to claim 1, wherein said visible light pulse laser (22) and said ultraviolet light pulse laser (23) are applied such that, while said object is relatively moved in one direction (71), said second irradiated region (36) is located more rearward in the direction in which said object moves than said first irradiated region (35).

3. The method according to claim 1, wherein a second harmonic of Nd:YAG is used as said visible light pulse laser (22), and a harmonic having a shorter wavelength than that of the second harmonic of Nd:YAG is used as said ultraviolet light pulse laser (23).

4. An apparatus for manufacturing a thin-film semiconductor, comprising:
visible light pulse laser irradiation means to focus visible light pulse laser (22) into a line shape on a surface of an object to be irradiated, and repeat irradiation with displacing said visible light pulse laser (22) such that a line-shaped irradiated region (35) is overlapped with a region (35) irradiated at a next timing in a width direction of the line-shaped irradiated region, to form a polycrystalline silicon film on the surface of said object; and

ultraviolet light pulse laser irradiation means to apply ultraviolet light pulse laser

(23) onto a second irradiated region (36) partially overlapping said first irradiated region (35) while or before said visible light pulse laser (22) is applied to said first irradiated region (35).

5 5. The apparatus according to claim 4, comprising:

 object moving means to relatively move said object in one direction (71); and
 irradiated region differentiating means to set said second irradiated region (36)
to be located more rearward in the direction in which said object moves than said first
irradiated region (35).

10 6. The apparatus according to claim 4, capable of applying a second harmonic
of Nd:YAG as said visible light pulse laser (22) and a harmonic having a shorter
wavelength than that of the second harmonic of Nd:YAG as said ultraviolet light pulse
laser (23).

 7. The apparatus according to claim 4, comprising:

15 a laser transmitting portion (10, 12, 13, 8) transmitting said visible light pulse
laser and said ultraviolet light pulse laser to allow said visible light pulse laser (2) and
said ultraviolet light pulse laser (3) to travel on an identical optical axis; and
 prisms (80) arranged in a symmetrical positional relation each other across said
optical axis to differentiate emitting angles of said visible light pulse laser and said
ultraviolet light pulse laser in said laser transmitting portion.